

Claims

1. A separation/recovery apparatus for heating volume-reduced gel-state polystyrene resin under ambient pressure or reduced pressure, to thereby remove solvent and recover resin, characterized in that the apparatus comprises:

an apparatus main unit having at the top of the unit a solvent-recovering section for continuously recovering evaporated solvent and having at the bottom of the unit a resin-recovering section for recovering the solvent-removed resin;

a heating medium flow pipe which is provided inside the apparatus main unit such that the pipe forms a multi-layer structure in the vertical direction and which allows flow of a heating medium inside the pipe;

a gel-state resin-feeding means for feeding the volume-reduced gel-state polystyrene resin such that the resin is brought into contact with the heating medium flow pipe;

a resin-holding section provided in the bottom of the apparatus main unit for holding the resin which has flowed down to the member after contact with the heating medium flow pipe;

a heating means for heating the resin held in the resin-holding section;

a stirring means for stirring the resin contained in the resin-holding section; and

regulating plates for guiding flow of the volume-

reduced gel-state polystyrene resin which flows while being in contact with the heating medium flow pipe, the regulating plates being provided in the vicinity of and along the heating medium flow pipe, with a predetermined spacing between the plates.

2. A separation/recovery apparatus according to claim 1, wherein the heating medium flow pipe is provided in a continuous helical manner in the apparatus main unit in the vicinity of the circumferential wall.

3. A separation/recovery apparatus according to claim 1 or 2, wherein the volume-reduced gel-state polystyrene resin which has been in contact with the heating medium flow pipe flows through the heating medium flow pipe and flows down from an upper section of the heating medium flow pipe to a lower section thereof, whereby the resin is transferred to the resin-holding section.

4. A separation/recovery apparatus according to any of claims 1 to 3, wherein the flow-regulating plates are provided in the lateral sides of the heating medium flow pipe with a predetermined spacing and are caused to be slanted such that the lower opening has a spacing narrower than that of the upper opening.

5. A separation/recovery apparatus according to claim 4, wherein the flow-regulating plates are provided so as to form a multi-layer structure in the vertical direction, the upper spacing increases in the vertical direction from the top to the bottom of the multi-layers, and the volume-reduced gel-

state polystyrene resin spilling over the upper ends of the flow-regulating plates flows down to the flow-regulating plates of a lower layer.

6. A separation/recovery apparatus according to any of claims 1 to 5, wherein the flow-regulating plates provided along the heating medium flow pipe forming the lowermost layer guide the resin which has flowed down from the heating medium flow pipe to the wall of the apparatus main unit.

7. A separation/recovery apparatus according to any of claims 1 to 6, wherein the heating means includes a heating medium circulation means for circulating a heating medium over the wall of the lower section of the apparatus main unit.

8. A separation/recovery apparatus according to claim 7, wherein the heating medium circulation means is linked to the heating medium flow pipe, whereby the heating medium is continuously circulated throughout the heating medium circulation means and the heating medium flow pipe.

9. A separation/recovery apparatus according to any of claims 1 to 8, wherein the inner surface of the resin-holding section is maintained at a temperature higher than the surface temperature of the heating medium circulating means.

10. A separation/recovery apparatus according to any of claims 1 to 9, wherein the heating means includes a heating medium circulation device which is in the general form of a hollow cylinder and which is provided surrounding the stirring means disposed virtually at the center of the bottom of the resin-holding section.

11. A separation/recovery apparatus according to any of claims 1 to 10, wherein the gel-state resin-feeding means includes a trough member which is provided above the heating medium flow pipe and which is rotatably operated, and a conduit for feeding the volume-reduced gel-state polystyrene resin onto the trough member, such that the volume-reduced gel-state polystyrene resin that has spilt over the trough member is caused to flow down to the heating medium flow pipe.

12. A separation/recovery apparatus according to any of claims 1 to 11, wherein the apparatus further includes a transfer pipe for transferring the resin discharged down from the resin-recovering section in a generally horizontal direction, and a discharge pump attached to the transfer pipe for recovering the resin.

13. A separation/recovery apparatus according to claim 12, wherein the apparatus further includes a heating means for heating around the transfer pipe.